What is claimed is:

1. A catalyst for removing dioxin, comprising 1-10 wt% of vanadium, 0.1-5 wt% of nickel, 0.1-5 wt% of molybdenum and 1-15 wt% of tungsten, on a mixture support consisting essentially of 10-50 wt% of alumina and 50-90 wt% of titania.

2. A method for preparing a dioxin removal catalyst, which comprises the following steps of:

a) pretreating a spent catalyst discharged from a hydro-desulfurization process of an oil refinery, which comprises 5-30 wt% of vanadium, 1-10 wt% of nickel, 1-10 wt% of molybdenum, 0.1-5 wt% of iron, 1-10 wt% of sulfur, 0.1-5 wt% of silicon and 0.1-5 wt% of phosphor on an alumina support by thermally treating said spent catalyst, followed by washing with water;

b) providing a titania impregnated with 1 to 20 wt% of tungsten;

c) homogeneously mixing the pretreated spent catalyst with the tungsten-impregnated titania under the addition of water and acid;

d) dehydrating the mixture to remove excess moisture and active metal components therein;

e) drying the dehydrated mixture, followed by grinding the dried mixture; and

f) forming a catalyst body by extruding the grinded mixture or coating the grinded mixture to a structure, followed by drying and then calcining the dried structure.

3. The method as defined in claim 2, wherein the thermally treating of the a) step is carried out at 300-400 °C for 3-5 hours.

4. The method as defined in claim 2, wherein the tungsten-impregnated titania has a specific surface area of 60-100 m^2/g and pore sizes of 150-200 Å, and has anatase crystalline structure.

5. The method as defined in claim 2, wherein the alumina support in the spent catalyst is a gamma alumina support, and has a specific surface area of 40-100 m^2/g and pore sizes of 150-300 Å.

6. The method as defined in claim 2, wherein the acid is oxalic acid or citric acid and is added at an amount of 3 to 7 wt% based on the spent catalyst and the tungsten-impregnated titania in the c) step.

7. The method as defined in claim 2, the c) step is carried out in the ball mill until 2-3 μm particles amount

to 40-60 vol%.

8. The method as defined in claim 2, wherein the spent catalyst and the tungsten-impregnated titania are mixed at weight ratio of 10:90-50:50 in the c) step.

9. The method as defined in claim 2, wherein the d) step is carried out by use of a filter press under a pressure of 10-15 kg/cm^2.

10. The method as defined in claim 2, wherein the e) step is conducted by use of a continuous dryer-miller.

11. The method as defined in claim 2, wherein the drying of the e) step is carried at 80-120 °C for 0.5-2 hours.

12. The method as defined in claim 2, wherein the drying of the f) step is carried by use of hot blast dryer, microwave dryer or thermohydrostat at 60-120 °C for 3-48 hours.

13. The method as defined in claim 2, wherein the calcining of the f) step is carried at 450-550°C for 3-5 hours.

14. The method as defined in claim 2, wherein the extruding comprises dry-mixing the grinded mixture with organic binders, inorganic binders and glass fiber; aging the dry-mixture, together with water, plasticizers, lubricants and dispersants, at 5 °C or lower for 1-2 days; kneading the aged mixture in a kneader 2-5 times; storing said kneaded mixture at 5 °C or lower for 1-5 days; and molding the stored mixture into a honeycomb form through a vacuum extruder.

15. The method as defined in claim 2, wherein the coating comprises applying, pouring or pressure-adhering a coating material including the grinded mixture, inorganic binders and water to a metal plate of honeycomb form or a cordierite-typed ceramic honeycomb.